



1

SEQUENCE LISTING

<110> Glaxo Wellcome PLC
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Grose, David T
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<151> 1998-03-18

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<170> PatentIn Ver. 2.1

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Gln Pro Arg Pro Gln Leu Asp Leu Lys Ala Ser Arg Lys Leu Pro Lys
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Leu Asp Pro Tyr Tyr Lys Asp His Lys Thr Phe Met Val Leu Asn Lys
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Lys Arg Thr Ile Tyr Arg Phe Ser Ala Lys Arg Ala Leu Phe Ile Leu
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Gly Pro Phe Asn Pro Leu Arg Ser Leu Met Ile Arg Ile Ser Val His
 115 120 125

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 130 135 140

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Tyr Val Phe Ile Gly Ile Tyr Ile Leu Glu Ala Val Ile Lys Ile Leu
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Pro Gly Ser Gln Val Asn Leu Ser Ala Leu Arg Thr Phe Arg Val Phe
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Arg Ala Leu Lys Ala Ile Ser Val Ile Ser Gly Leu Lys Val Ile Val
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Gly Ala Leu Leu Arg Ser Val Lys Lys Leu Val Asp Val Met Val Leu
245 250 255

Thr Leu Phe Cys Leu Ser Ile Phe Ala Leu Val Gly Gln Gln Leu Phe
260 265 270

Met Gly Ile Leu Asn Gln Lys Cys Ile Lys His Asn Cys Gly Pro Asn
275 280 285

Pro Ala Ser Asn Lys Asp Cys Phe Glu Lys Glu Lys Asp Ser Glu Asp
290 295 300

Phe Ile Met Cys Gly Thr Trp Leu Gly Ser Arg Pro Cys Pro Asn Gly
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340 345 350

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 565 570 575

 Ala Ile Thr Ile Cys Ile Ile Ile Asn Thr Val Phe Leu Ala Val Glu
 580 585 590

His His Asn Met Asp Asp Asn Leu Lys Thr Ile Leu Lys Ile Gly Asn
 595 600 605
 Trp Val Phe Thr Gly Ile Phe Ile Ala Glu Met Cys Leu Lys Ile Ile
 610 615 620
 Ala Leu Asp Pro Tyr His Tyr Phe Arg His Gly Trp Asn Val Phe Asp
 625 630 635 640
 Ser Ile Val Ala Leu Leu Ser Leu Ala Asp Val Leu Tyr Asn Thr Leu
 645 650 655
 Ser Asp Asn Asn Arg Ser Phe Leu Ala Ser Leu Arg Val Leu Arg Val
 660 665 670
 Phe Lys Leu Ala Lys Ser Trp Pro Thr Leu Asn Thr Leu Ile Lys Ile
 675 680 685
 Ile Gly His Ser Val Gly Ala Leu Gly Asn Leu Thr Val Val Leu Thr
 690 695 700
 Ile Val Val Phe Ile Phe Ser Val Val Gly Met Arg Leu Phe Gly Thr
 705 710 715 720
 Lys Phe Asn Lys Thr Ala Tyr Ala Thr Gln Glu Arg Pro Arg Arg Arg
 725 730 735
 Trp His Met Asp Asn Phe Tyr His Ser Phe Leu Val Val Phe Arg Ile
 740 745 750
 Leu Cys Gly Glu Trp Ile Glu Asn Met Trp Gly Cys Met Gln Asp Met
 755 760 765
 Asp Gly Ser Pro Leu Cys Ile Ile Val Phe Val Leu Ile Met Val Ile
 770 775 780
 Gly Lys Leu Val Val Leu Asn Leu Phe Ile Ala Leu Leu Leu Asn Ser
 785 790 795 800

Phe Ser Asn Glu Glu Lys Asp Gly Ser Leu Glu Gly Glu Thr Arg Lys
 805 810 815
 Thr Lys Val Gln Leu Ala Leu Asp Arg Phe Arg Arg Ala Phe Ser Phe
 820 825 830

 Met Leu His Ala Leu Gln Ser Phe Cys Cys Lys Lys Cys Arg Arg Lys
 835 840 845

 Asn Ser Pro Lys Pro Lys Glu Thr Thr Glu Ser Phe Ala Gly Glu Asn
 850 855 860

 Lys Asp Ser Ile Leu Pro Asp Ala Arg Pro Trp Lys Glu Tyr Asp Thr
 865 870 875 880

 Asp Met Ala Leu Tyr Thr Gly Gln Ala Gly Ala Pro Leu Ala Pro Leu
 885 890 895

 Ala Glu Val Glu Asp Asp Val Glu Tyr Cys Gly Glu Gly Gly Ala Leu
 900 905 910

 Pro Thr Ser Gln His Ser Ala Gly Val Gln Ala Gly Asp Leu Pro Pro
 915 920 925

 Glu Thr Lys Gln Leu Thr Ser Pro Asp Asp Gln Gly Val Glu Met Glu
 930 935 940

 Val Phe Ser Glu Glu Asp Leu His Leu Ser Ile Gln Ser Pro Arg Lys
 945 950 955 960

 Lys Ser Asp Ala Val Ser Met Leu Ser Glu Cys Ser Thr Ile Asp Leu
 965 970 975

 Asn Asp Ile Phe Arg Asn Leu Gln Lys Thr Val Ser Pro Lys Lys Gln
 980 985 990

 Pro Asp Arg Cys Phe Pro Lys Gly Leu Ser Cys His Phe Leu Cys His

995	1000	1005
Lys Thr Asp Lys Arg Lys Ser Pro Trp Val Leu Trp Trp Asn Ile Arg		
1010	1015	1020
Lys Thr Cys Tyr Gln Ile Val Lys His Ser Trp Phe Glu Ser Phe Ile		
025	1030	1035 1040
Ile Phe Val Ile Leu Leu Ser Ser Gly Ala Leu Ile Phe Glu Asp Val		
1045	1050	1055
Asn Leu Pro Ser Arg Pro Gln Val Glu Lys Leu Leu Arg Cys Thr Asp		
1060	1065	1070
Asn Ile Phe Thr Phe Ile Phe Leu Leu Glu Met Ile Leu Lys Trp Val		
1075	1080	1085
Ala Phe Gly Phe Arg Arg Tyr Phe Thr Ser Ala Trp Cys Trp Leu Asp		
1090	1095	1100
Phe Leu Ile Val Val Val Ser Val Leu Ser Leu Met Asn Leu Pro Ser		
1105	1110	1115 1120
Leu Lys Ser Phe Arg Thr Leu Arg Ala Leu Arg Pro Leu Arg Ala Leu		
1125	1130	1135
Ser Gln Phe Glu Gly Met Lys Val Val Val Tyr Ala Leu Ile Ser Ala		
1140	1145	1150
Ile Pro Ala Ile Leu Asn Val Leu Leu Val Cys Leu Ile Phe Trp Leu		
1155	1160	1165
Val Phe Cys Ile Leu Gly Val Asn Leu Phe Ser Gly Lys Phe Gly Arg		
1170	1175	1180
Cys Ile Asn Gly Thr Asp Ile Asn Met Tyr Leu Asp Phe Thr Glu Val		
1185	1190	1195 1200

Pro Asn Arg Ser Gln Cys Asn Ile Ser Asn Tyr Ser Trp Lys Val Pro		
1205	1210	1215
Gln Val Asn Phe Asp Asn Val Gly Asn Ala Tyr Leu Ala Leu Leu Gln		
1220	1225	1230
Val Ala Thr Tyr Lys Gly Trp Leu Glu Ile Met Asn Ala Ala Val Asp		
1235	1240	1245
Ser Arg Glu Lys Asp Glu Gln Pro Asp Phe Glu Ala Asn Leu Tyr Ala		
1250	1255	1260
Tyr Leu Tyr Phe Val Val Phe Ile Ile Phe Gly Ser Phe Phe Thr Leu		
265	1270	1275 1280
Asn Leu Phe Ile Gly Val Ile Ile Asp Asn Phe Asn Gln Gln Gln Lys		
1285	1290	1295
Lys Leu Gly Gly Gln Asp Ile Phe Met Thr Glu Glu Gln Lys Lys Tyr		
1300	1305	1310
Tyr Asn Ala Met Lys Lys Leu Gly Thr Lys Lys Pro Gln Lys Pro Ile		
1315	1320	1325
Pro Arg Pro Leu Asn Lys Cys Gln Ala Phe Val Phe Asp Leu Val Thr		
1330	1335	1340
Ser Gln Val Phe Asp Val Ile Ile Leu Gly Leu Ile Val Leu Asn Met		
345	1350	1355 1360
Ile Ile Met Met Ala Glu Ser Ala Asp Gln Pro Lys Asp Val Lys Lys		
1365	1370	1375
Thr Phe Asp Ile Leu Asn Ile Ala Phe Val Val Ile Phe Thr Ile Glu		
1380	1385	1390
Cys Leu Ile Lys Val Phe Ala Leu Arg Gln His Tyr Phe Thr Asn Gly		
1395	1400	1405

Trp Asn Leu Phe Asp Cys Val Val Val Val Leu Ser Ile Ile Ser Thr
 1410 1415 1420

Leu Val Ser Arg Leu Glu Asp Ser Asp Ile Ser Phe Pro Pro Thr Leu
 425 1430 1435 1440
 Phe Arg Val Val Arg Leu Ala Arg Ile Gly Arg Ile Leu Arg Leu Val
 1445 1450 1455

Arg Ala Ala Arg Gly Ile Arg Thr Leu Leu Phe Ala Leu Met Met Ser
 1460 1465 1470

Leu Pro Ser Leu Phe Asn Ile Gly Leu Leu Leu Phe Leu Val Met Phe
 1475 1480 1485

Ile Tyr Ala Ile Phe Gly Met Ser Trp Phe Ser Lys Val Lys Lys Gly
 1490 1495 1500

Ser Gly Ile Asp Asp Ile Phe Asn Phe Glu Thr Phe Thr Gly Ser Met
 505 1510 1515 1520

Leu Cys Leu Phe Gln Ile Thr Thr Ser Ala Gly Trp Asp Thr Leu Leu
 1525 1530 1535

Asn Pro Met Leu Glu Ala Lys Glu His Cys Asn Ser Ser Ser Gln Asp
 1540 1545 1550

Ser Cys Gln Gln Pro Gln Ile Ala Val Val Tyr Phe Val Ser Tyr Ile
 1555 1560 1565

Ile Ile Ser Phe Leu Ile Val Val Asn Met Tyr Ile Ala Val Ile Leu
 1570 1575 1580

Glu Asn Phe Asn Thr Ala Thr Glu Glu Ser Glu Asp Pro Leu Gly Glu
 585 1590 1595 1600

Asp Asp Phe Glu Ile Phe Tyr Glu Val Trp Glu Lys Phe Asp Pro Glu

1605	1610	1615
Ala Ser Gln Phe Ile Gln Tyr Ser Ala Leu Ser Asp Phe Ala Asp Ala		
1620	1625	1630
Leu Pro Glu Pro Leu Arg Val Ala Lys Pro Asn Lys Phe Gln Phe Leu		
1635	1640	1645
Val Met Asp Leu Pro Met Val Met Gly Asp Arg Leu His Cys Met Asp		
1650	1655	1660
Val Leu Phe Ala Phe Thr Thr Arg Val Leu Gly Asp Ser Ser Gly Leu		
665	1670	1675 1680
Asp Thr Met Lys Thr Met Met Glu Glu Lys Phe Met Glu Ala Asn Pro		
1685	1690	1695
Phe Lys Lys Leu Tyr Glu Pro Ile Val Thr Thr Thr Lys Arg Lys Glu		
1700	1705	1710
Glu Glu Gln Gly Ala Ala Val Ile Gln Arg Ala Tyr Arg Lys His Met		
1715	1720	1725
Glu Lys Met Val Lys Leu Arg Leu Lys Asp Arg Ser Ser Ser Ser His		
1730	1735	1740
Gln Val Phe Cys Asn Gly Asp Leu Ser Ser Leu Asp Val Ala Lys Val		
745	1750	1755 1760
Lys Val His Asn Asp		
1765		

<210> 3

<211> 299

<212> DNA

<213> Homo sapiens

<400> 3

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 ggaatttccg ccccttcaact tccgactctc tggttgcaat tgagaagcgg attgccatcc 180
 aaaaggagaa aaagaagtct aaagaccaga caggagaagt accccagcct caacctcagc 240
 ttgacctaaa ggctccagg aagttgcca actctatggc gacaatcctc ggaggcttt 299

<210> 4

<211> 140

<212> DNA

<213> Homo sapiens

<400> 4

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 gccctggtag gtcagcagct cttcatggga agtctgaacc tgaaatgcat ctgagggac 120
 tgtaaaaata tcagtaaccc 140

<210> 5

<211> 232

<212> DNA

<213> Homo sapiens

<400> 5

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 tgaattcaaa atgtgtggca tctggatggg taacagtgcc tgttccatac aatatgaatg 120
 taagcacacc aaaattaatc ctgactataa ttatacgaat ttgacaact ttggctggtc 180
 ttttcttgcc atgttccggc tgatgaccca agattcctgg gagaagcttt at 232

<210> 6
<211> 180
<212> DNA
<213> Homo sapiens

<400> 6
actactgggt ctactcagtc ttctttcttca ttgtggatcat tttcctgggg ctcccttcta 60
cctgattaac ttaaaccctg gctgttggtta ccatgggcat atgaggagcc gaacaagaat 120
gtagctgcag agatagaggc ccaggaaaag atgttcagga agcccagcag ctgggttaaag 180

<210> 7
<211> 180
<212> DNA
<213> Homo sapiens

<400> 7
tatcactgga ccactttgat gagcatggag atcctctcca aaggcagaga gactgagtg 60
ttgtcagcat cctcaccatc accatgaagg gtaagttcca catcccaatc caagggaaaag 120
tctacttcag tgatgtcctt ccattcttct tcttcccaat ccctagaag cctctgcaa 180

<210> 8
<211> 299
<212> DNA
<213> Homo sapiens

<400> 8
gagaaatctg gattgcctca gagctaattc ctcaacctct cgcgcattct cctccagaac 60
aagaaaaatc acaagagcct tgtctccctt gtggagaaaa cctggcatcc aagtacctcg 120

tgtggaactg ttgccccag tggctgtgcg taaagaaggt cctgagaacc gtcacgacgg 180

tcccgtttac tgagctggac atcacgacgt gcatcatcat caacacagac ttcttggaca 240

tggagcatca caagatgtaa ggcaacgtat tggagacgat gttgaatata gggcagtag 299

<210> 9
<211> 335
<212> DNA
<213> Homo sapiens

<400> 9
gcagatggag ttcgcttaac tggcttttct cegttttcgt tcgtcgcttt ttctacagct 60
caggtcttca agtaccaaact cctggccaac tttgaacaca ctaattaaga taatccggca 120
actctcgctg gagcccttgg aagcctgact gtggctcctgg tcattgtgat ctttattttc 180
tcagtagttg gcatgcagct ttttggccgt agcttcaatt cccaaaagag tccaaaactc 240
tgtaaccgga caggcccgac agtctcatgt ttacggcact ggcacatggg ggatttctgg 300
cactccttcc tagtgggtatc gcgcaccttc ttgcg 335

<210> 10
<211> 261
<212> DNA
<213> Homo sapiens

<400> 10
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ggaggaagat gacgttgaat tttctggtga agataatgca cagcgcacatca cacaacctga 120
gcctgaacaa caggtatgaa ggttcacaca tagacttaaa ggtcatacaa agctggagtt 180
atcacagggc actggttagcc tacccttttc taggcactat gcaaggataa taaggattct 240
cgtacgcacg ggtacgattc g 261

<210> 11
<211> 215
<212> DNA
<213> Homo sapiens

<400> 11
cagacaatga gaaactccgt actactatgg tgaaagaagg tcttagtaaa aggcaccccc 60
ttccttttgt tctgatgtgc agaagtatga tgttaccagt atactatcag aatgtagcac 120
cattgatctt caggatggct ttggatgggt acctgagatg gttcccaaag aaaaatttcc 180
agcgattttt cgtaccaacg gttacgcttc gaagg 215

<210> 12
<211> 346
<212> DNA
<213> Homo sapiens

<400> 12
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agaaccttcc ggatctacga gcaactgagc ctctcgtgcg ctgtcccagt ttgaaggaat 120
gaaggtaacat tctgcagaag aatgggtaga agttcagtta acagagaaag gtggaaagac 180
caacagttct ttttgggctg agatttcctt aaattgccaa gcttttctctg gggtacttac 240
cagcctgccc agtgcttaga atttgagggg tagagaaaag cctaagatat actttctacc 300
ctaaaagctt ctgtgacagc caagatgagc tgtagcgaag gaattc 346

<210> 13
<211> 223
<212> DNA
<213> Homo sapiens

<400> 13
ggatgcatccc taccatct gttatgggtt tcctttgctt ttgttttcca taagggtgtg 60
gtcaatgctc tcataggtgc catacctccc attcctgaat gttttgcttg tctgcctcat 120
ttcttggtc gtattttgta ttctgggagt atacttcctt ttctggaaa atttgggaaa 180
tgcattcaat ggaacagact tttaggaatt tccagcgatt cct 223

<210> 14
<211> 244
<212> DNA
<213> Homo sapiens

<400> 14
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atcgtttatg cagctgttga ttccacagag gtgagtcagt gttctaccat gttcggcagt 120
gttatggcca agtcagagat atcatgacta catggacagt ccagaactgg cgatcatagt 180
ccagcagctg gggttctctg ccttggttcc ttggaacaa aacactatga gataccactg 240
ccta 244

<210> 15
<211> 409
<212> DNA
<213> Homo sapiens

<400> 15

atccacccca ggccccgcca catgccatca ctccaagctg agctgcgaaa actgaaagac 60
aggctcccaa caggggctat ggctgttagg aagaggctat gtagtcaatg ttgctgctaa 120
gaaacacctt ggtcttctag ataaggtagt tagaatgctt atatttttct ccagtaattg 180
tttttttctc ttattaaaaa aatttctaac agaaagaaca acagccagag ttgagagca 240
attcactcgg ttacatttct tcgtagtctt tatcatcttt ggctcattct tcaactctgaa 300
tctcttcatt ggcgttatca ttgacaactt caaccaacag cagaaaaaga taagtatctg 360
ggttgtcttg atttggtaat tgtatctctg tcttccaaag aaggaatcc 409

<210> 16

<211> 585

<212> DNA

<213> Homo sapiens

<400> 16

tttcccagac aatacaaggt ctogtgtgcc catagcccag gcagtctttt cgacatcatc 60
ataagctcat acctaaacca tgattggctt gatggcctaa atatacaacc aacccccaaag 120
ccatggaatc catccttgac catctccaac tgggtctttg tggatcatctt tacgttagaa 180
tgtctcatca aaatctttgc tttgaggcaa tactacttca ccaatggctg gaatttattt 240
gactgtgtgg tcgtgcttct ttccattggt agtaagtaaa atcagcagtc agaggggactt 300
taagaaccag aagtaagttt gtaaacttta tcattttttg aagtttggtc aaactatcca 360
caaagcagaa aactgggcca agtgtacttt ctgaaagaat agacaggggt actaatgcc 420
ttctctactg ggaagttgct aggagatagg aggcggtaaa tttctgggtc cccttaactc 480

actacacaac tgaaatagag ttcaataatc atgcagctaa tgtattcaat ggaaatagac 540

aaaattaaaa tgactcagaa gtttttgggg tggtagaaaa atttc 585

<210> 17

<211> 223

<212> DNA

<213> Homo sapiens

<400> 17-

tgaccaaggt ggacaaaat gacttgggaa aacgggcctc attcaccact ccagactctt 60

tgcaatggag acttgtctag ctttgggggtg gccaaaggga aggtccactg tgactgagcc 120

ctcacctcca cgctacctc atagcttcac agccttgcct tcagcctctg agctccaggg 180

gtcagcagct tagtgtatca acagggagtg gattcaccaa att 223

<210> 18

<211> 19

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Primer

<400> 18

cctsgtcatg ttcattctac

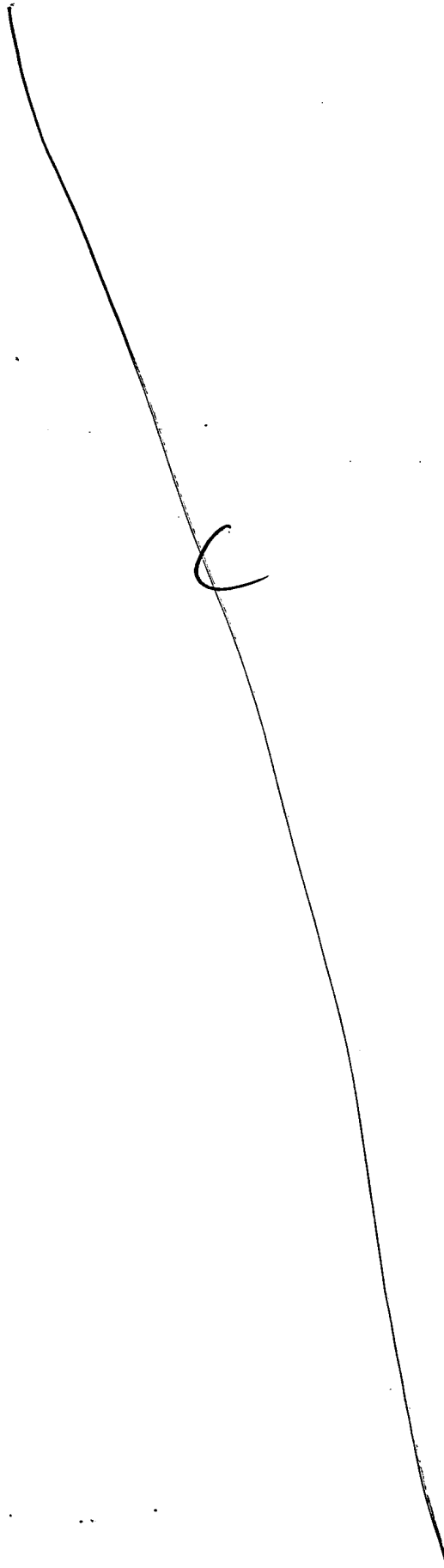
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<210> 19

<211> 22

<212> DNA

<213> Artificial Sequence



<220>

<223> Description of Artificial Sequence: Primer

<400> 19

ctcatargar aycttggar gg

22

<210> 20

<211> 21

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Primer

<400> 20

agggaggtca ccggcctgaa m

21

<210> 21

<211> 21

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Primer

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agtggatmga gamcatgtgg g

21

<210> 22

<211> 18

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic
sequence

<400> 22

Cys Asn Gly Asp Leu Ser Ser Leu Asp Val Ala Lys Val Lys Val His
1 5 10 15

Asn Asp

<210> 23

<211> 15

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic
sequence

<400> 23

Glu Glu Arg Tyr Tyr Pro Val Ile Phe Pro Asp Glu Arg Asn Cys
1 5 10 15

<210> 24

<211> 30

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Primer

<400> 24

gatcgaattc aaggagaaaa tggttcagga

<210> 25

<211> 30

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Primer

<400> 25

gatcgtcgac tcatttggtc tgctcaagga

30

<210> 26-

<211> 30

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Primer

<400> 26

gatcgaattc ggcggtgccc taccacctc

30

<210> 27

<211> 30

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Primer

<400> 27

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30

<210> 28

<211> 30

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Primer

<400> 28

gatcgaattc aagcacaact gtggcccca

30

<210> 29

<211> 30

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Primer

<400> 29

gatcgtcgac tcacattatg aagtcttcgc

30

<210> 30

<211> 18

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:
Oligonucleotide

<400> 30

agtacctctc ctccatct

18

<210> 31

<211> 18

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:

Oligonucleotide

<400> 31

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18

<210> 32

<211> 18

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:.

Oligonucleotide

<400> 32

cacggttag tacctctc

18

<210> 33

<211> 18

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:

Oligonucleotide

<400> 33

cacggttag tcactctc

18

<210> 34

<211> 18

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:

Oligonucleotide

<400> 34

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18

<210> 35

<211> 18

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:

Oligonucleotide

<400> 35

gtctggtgac ttcttcct

18